

American Society for Testing Materials BULLETIN

ISSUED



BI MONTHLY

The Spirit of Research

RESEARCH conveys at least two ideas: experimental studies in unexplored fields of science, and correlation of discoveries in partially explored fields and the systematizing and codifying of the correlated work. Both of these are exemplified in the work of the Society and their direct importance in the Society is obvious.

The indirect results of the spirit of research are less obvious but perhaps equally important. This spirit of research, an intellectual curiosity to find out the truth, has become a large factor in our specification work as well as in our distinctively research work. Let us see to it that this research spirit pervades all our Society activities.

H. F. MOORE, *President.*

July, 1927

ENGINEERS' CLUB BUILDING
1315 SPRUCE ST., PHILADELPHIA

OLSEN

Universal Testing Machine

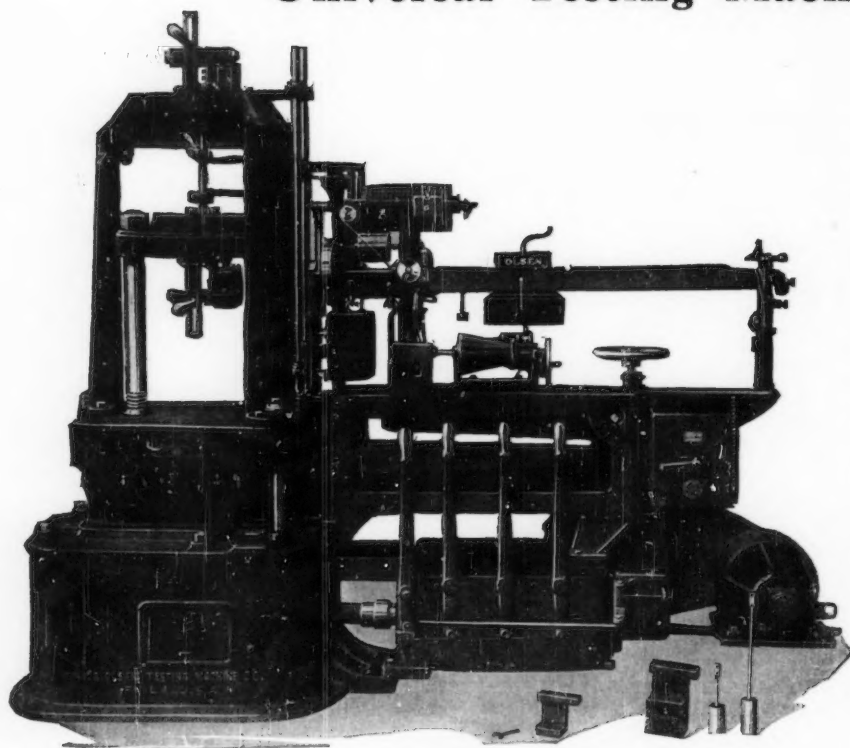


Plate 1086

This illustration represents the last word in testing machine construction. A completely Automatic and Autographic Universal Testing Machine for all tests, and of triple capacity. A machine provided with our latest Automotive Drive, having eight speeds and reverse, and with all fast speed gearing entirely enclosed, running in a bath of oil and ball bearing mounted. Also arranged for hand operation, and provided with automatic indicator showing operator speed of head at all times.

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American Society for Testing Materials



BULLETIN

ENGINEERS' CLUB BUILDING

1315 SPRUCE STREET

PHILADELPHIA, PENNA.

NUMBER 27

JULY 30, 1927

The Thirtieth Annual Meeting

AS the first meeting in the Middle West, or in fact at any distance from the Atlantic seaboard, the recent annual meeting held June 20-24 at French Lick Springs Hotel, French Lick, Ind., was a distinct success. The attendance, of course, was not as great as at the meetings held in recent years at Atlantic City, since there was not the same opportunity for the attendance of those who might come to the meeting to attend single sessions. There were 560 members present or represented, 68 guests and 93 ladies. This represents an attendance of over 70 per cent of that of the 1926 meeting, which meeting was the largest ever held.

The feature of the meeting, of course, was the twenty-fifth anniversary of the incorporation of the Society. This was suitably commemorated by an anniversary dinner held on Wednesday evening, June 22, at which those who had been members for 25 years were the honored guests. Eighteen of the 66 who had continuously been members of the Society since 1902 were present at the dinner. In addition to those who had held individual membership in the Society there were some 75 firms and corporations who had held membership since 1902 and of these, 50 were represented. The evening was quite inspiring, for due to the presence of these twenty-five-year members and through the presentation of certificates of honorary membership to the two living incorporators, Robert W. Lesley and William R. Webster, and to Past-President A. A. Stevenson, who had been a member since 1896, many incidents of the early days of the Society were recalled which brought to light the unselfish efforts and farsightedness of the founders.

President Gibboney's inspiring remarks on the past 25 years of the Society are recorded elsewhere in the BULLETIN.

The dinner was also the occasion of the award of the Charles B. Dudley Medal to Dr. D. J. McAdam, Jr., for his paper entitled "Stress-Strain-Cycle Relationship and Corro-

sion-Fatigue of Metals" presented at the 1926 annual meeting. This was the first award of the Dudley Medal.

The 13 sessions included 4 pairs of simultaneous sessions. The first session, a general opening session, was held on Tuesday afternoon, June 21, followed immediately by two simultaneous technical sessions. The closing session was held on Friday evening, June 24. Except for Tuesday, the afternoons were kept open for recreation and for committee meetings and for the Edgar Marburg Lecture which was held on Wednesday afternoon. The presidential address was a feature of the Tuesday evening session.



PRESIDENT H. F. MOORE

Research Professor of Engineering Materials, University of Illinois. He was graduated from New Hampshire College, Durham, N. H., in 1898. He received the degree of mechanical engineer from Cornell University, Ithaca, N. Y., in 1899, and a master's degree in 1903. From 1900 to 1901 he was connected with Colby Academy, New London, N. H., and for the next three years was an instructor at Cornell University. From 1904 to 1907 he was Assistant Professor, University of Wisconsin, and since 1907 with the University of Illinois.

Presidential Address

The President, J. H. Gibboney, was introduced by the presiding officer, Past-President F. M. Farmer. The President very appropriately called attention to the opportunities for increasing the usefulness of the Society's work. He outlined, for the purpose of emphasis, the present procedure set up by the Society for developing standards to insure that these standards were quite impartial and represented the best interests of both producer and consumer, safeguarding the consumer in securing satisfactory materials, since safety was always the paramount consideration. The standardization work of the Society is represented by four steps:

1. The development of methods of testing materials.
2. The setting up of standard definitions and statements of nomenclature.
3. The formulation of specifications defining the quality and tests of materials.
4. The preparation of recommended practices governing certain processes in the utilization of materials.

He called attention to the many investigations that were necessary in developing any standards in order to settle moot questions. Having once established satisfactory specifications and methods of test it devolved upon the Society

ANNIVERSARY ADDRESS BY THE RETIRING PRESIDENT

James H. Gibboney

EVERY ANNIVERSARY is a significant occasion in the life of an organization. It is a time to turn back the years, so to speak, and by re-examination get a perspective view of our successes and our failures. We may justly take pride in our successes and, if we are wise, we may find profit in our failures.

The twenty-fifth anniversary in the life of our organization is an especially important one, for it seems that through the years our plans and purposes have withstood the test of time, and by duties well done we have proven the right to live and to grow as a helpful part of our industrial life.

As an individual, so an organization grows old, and some exceed their three score years and ten, their usefulness increasing with the years so long as they inspire in each succeeding generation hopes and aspirations for the future. Let us view our hopes and aspirations.

Twenty-five years ago they were outwardly expressed by so-called dreamers, men with visions of service in a field that was little understood. The romances of these early days show our dreamers men of purpose, patience and perseverance, and by fidelity to these virtues has grown this great national organization which today is reaching in a helpful way every important industry in the country.

As of old, all men at times dream dreams and see visions, and in our dreams it seems we live somewhere in the great unknown where earth and heaven meet. Dreamers who leave the earth too long are apt to become impractical and of little worth, and just in the same way dreamers who leave the skyline lose the heavenly inspiration and become selfish, sordid and unkind. May we in our dreams fix our thoughts on purposes that will inspire and lead on to a greater service to mankind,

*'For a dreamer lives forever,
And a toiler dies in a day.'*

and its committees to see that the amount of energy expended in preparing them was capitalized in the general use of these specifications. In conclusion he remarked:

"With this restatement of the faith that is within us concerning our plans and purposes, we may take courage for greater usefulness, in the confidence that the things we are seeking to do will contribute in no small measure to the future happiness and well-being of mankind, by making this world a better and a safer place for us and for our children to work out their destinies."

Announcement of Election of Officers

The canvass of the ballot for officers showed that 988 legal ballots had been cast and that the following officers had been elected:

For President, to serve for one year: H. F. Moore, Professor of Engineering Materials, University of Illinois.

For Vice-President, to serve for two years: T. D. Lynch, Manager, Materials and Process Engineering Department, Westinghouse Electric and Manufacturing Co., East Pittsburgh, Pa.

For Members of the Executive Committee, to serve for two years:

F. O. Clements, Director of Research, General Motors Corporation, Detroit, Mich.

W. H. Klein, General Manager, Southern Division, Pennsylvania-Dixie Cement Corporation, Chattanooga, Tenn.

F. C. Langenberg, Vice-President, Climax Molybdenum Co., and Consulting Engineer for U. S. War Department, 61 Broadway, New York City.

F. N. Speller, Metallurgical Engineer, National Tube Co., Frick Building, Pittsburgh, Pa.

The newly elected President, after being presented to the meeting, expressed his appreciation of the honor of his election to the presidency and the hope that the Society under his administration might continue the work that had been so brilliantly carried on by his predecessors.

The newly elected Vice-President thanked the members for the honor bestowed upon him and in doing so stated that he realized that the office was one of responsibility but that with the responsibility came the pleasure of doing things that were worth while, for the work of the Society, as he realized from many years' connection with it, had produced many results that were distinctly worth while and had brought distinction to the Society, both here and abroad.



Members and guests in attendance at the Twenty-fifth Anniversary meeting

Edgar Marburg Lecture

The second Edgar Marburg lecture was held on Wednesday afternoon. The President, in opening the session, restated the reasons for the institution of the Edgar Marburg Lecture, and the meaning that was attached to it, namely, that it was for the double purpose of fixing our thoughts on the ideas of the man who contributed so largely to the character of the Society and to receive inspiration from some eminent engineer who in his lecture would bring to the members some phases of recent development in the knowledge of materials. The lecturer, Dr. George L. Clark, Professor of Applied Chemical Research and Divisional Director of the Research Laboratory of Applied Chemistry in the Massachusetts Institute of Technology, then spoke on "X-rays in Industry."

Doctor Clark, in his lecture, outlined briefly the nature of X-rays and of the application of X-rays in metallography in the location of defects in metal castings, etc. The major portion of his lecture was devoted to a description of more recent applications of the X-ray in the study of crystal structures, particularly by means of the "pinhole" method. The X-ray had more recently been applied not only to steel and other metals but to non-metals as well, such as wood, rubber and textiles, and gave promise of becoming the most fundamental method of examination of materials.

Action on Proposed Standards

Forty committees of the Society presented reports. Most of these contained recommendations on standards, either submitting new tentative standards or revising existing standards. As a result of the actions on these recommendations 45 new tentative standards were accepted and 95 existing tentative standards were advanced to standard. Fifty-seven existing standards were revised and nine standards and six tentative standards were withdrawn. The magnitude of the standardization work represented by these actions is, of course, partly due to the fact that the Book of Standards is being reissued this year. This book will now contain 340 standard specifications, methods of test, definitions, etc. The Society, in addition, will have 175 tentative standards.

Technical Papers

Corrosion again received considerable attention, several reports and papers on this subject and on the subject of fatigue being presented at a general session on Thursday morning, no parallel session being held at the same time. The effect of heat treatment upon the properties of metals is of ever increasing importance and was again discussed. Considerable progress was reported in the magnetic analysis of steel, and papers were presented upon practical applications of such tests.

The usual number of interesting papers on testing and testing apparatus were presented. One paper described a new apparatus for measuring elongation and another discussed the application of the spectrograph in an industrial laboratory.

Of no less importance were the papers entering into a Symposium on Field Control of the Quality of Concrete. These papers covered all phases of the subject, from the proportioning, mixing and placing to the testing of concrete in the field. The papers provoked considerable discussion which should prove of much value to the engineer in properly evaluating some of the more recent developments.

Entertainment Features

The Entertainment Committee, under the chairmanship of W. H. Finkeldey, spared no efforts to make the members' stay at French Lick a pleasant one. A number of events were planned especially for the ladies, such as a bridge tournament on Wednesday afternoon, in which 40 ladies took part, and informal teas and concerts. The annual dance was held on Wednesday evening after the dinner.

The golf tournament continued to be the most popular of all the entertainment features, with the total of 39 entries. It was held on Friday afternoon on the course adjacent to the hotel. The A.S.T.M. championship golf cup for the low score was won by J. H. Chubb. The tennis tournament was also held on Friday afternoon, the A.S.T.M. championship tennis cup being won by R. J. McKay. Other prize winners in golf and tennis were: H. H. Morgan, H. D. Beattie, E. D. Boyer, H. B. Pullar, A. F. Braid, D. W. Mulford, W. H. Finkeldey, E. W. McMullen, H. A. Bedworth, F. A. Weidman, C. L. Warwick, W. H. McCune, and F. S. Crane.

Reprints of Edgar Marburg Lecture

Members who wish to secure reprints of the second Edgar Marburg lecture, delivered at the 1927 annual meeting by Dr. George L. Clark on "X-rays in Industry," kindly send in their request to the Secretary-Treasurer, using the enclosed post card for the purpose. The reprints should be available some time in September.

Discussion Will Still Be Received

Written discussion of the papers and reports presented at the recent annual meeting may be sent in to the Committee on Papers and Publications until September 1. Discussions received after that date may or may not be included in the Proceedings. The chairmen of committees and authors of papers will have an opportunity of reviewing these discussions and of preparing closures.



50th Annual Meeting of the Society, French Lick, Ind., June 20-24.

International Congress for Testing Materials

Eighteen papers by members of the Society are on the program of the International Congress for Testing Materials to be held at Amsterdam, Holland, September 12 to 17. These papers were solicited by a special committee of the Society appointed to plan for A.S.T.M. participation in the Congress. As will be seen from the list of titles, the papers cover a rather wide range of materials and have been prepared by members who can speak authoritatively on the subjects they have discussed:

General

"Materials Testing as a Stimulus to Research," by T. D. LYNCH, Manager, Materials and Process Engineering Department, Westinghouse Electric and Manufacturing Co.

Metals

"A Résumé of the Development and Application of High-Power Metallography and the Ultra-Violet Microscope," by F. F. LUCAS, Metallurgist, Bell Telephone Laboratories, Inc.

"The Fatigue of Metals—A Study of Changing Concepts of Stress, Strain and Strength," by H. F. MOORE, Research Professor of Engineering Materials, University of Illinois.

"Fatigue and Corrosion-Fatigue of Metals," by D. J. McADAM, Jr., Metallurgist, U. S. Naval Engineering Experiment Station.

"Properties of Ferrous Metals at Elevated Temperatures as Determined by Short-Time Tensile and Expansion Tests," by A. E. WHITE, Professor of Metallurgical Engineering, University of Michigan.

"Corrosion-Resistant Ferrous Alloys," by J. A. MATHEWS, Vice-President and Metallurgist, Crucible Steel Company of America.

"Use and Development of Magnetic Analysis in the United States," by A. V. DE FOREST, Research Engineer, American Chain Co.

"Durability Tests of Nickel-Chromium Resistor Materials," by F. E. BASH, Manager, Technical Department, Electrical Alloy Division, Driver-Harris Co., and J. W. HARSCH, Research Engineer, Leeds and Northrup Co.

Cement, Concrete, Stone and Brick

"Volumetric Changes in Portland-Cement Mortars and Concrete Due to Causes Other Than Variations in Temperature," by R. E. DAVIS, Professor of Civil Engineering, University of California.

"Design of Concrete Mixtures," by R. W. CRUM, Engineer of Materials and Tests, Iowa State Highway Commission.

Miscellaneous

"The Importance of Standard Thermometers in the Testing of Materials," by W. H. FULWEILER, Chemical Engineer, United Gas Improvement Co.

"The Use of the Spectral Reflection Curve as a Practical Method of Specifying, Recording and Verifying the Color of Paint and Other Color Standards," by F. P. INGALLS, Chemist, John W. Masury and Son.

"Viscosity Testing of Petroleum," by V. L. CHECHOT, Inspection Engineer, Atlantic Refining Co.

"Some Methods of Testing Paint and Varnish Materials," by P. H. WALKER, Chemist, U. S. Bureau of Standards.

"Testing of Coal and Coke," presented in 4 parts, Part I, by W. B. CALKINS, Chemist and Fuel Engineer, Coleman and Company; Part II, by A. C. FIELDNER, Chief Engineer, Division of Mining Experiment Stations, U. S. Bureau of Mines, and W. A. SELVIG, Associate Chemist, U. S. Bureau of Mines; Part III, by O. O. MALLETS, Chief Chemist, The Koppers Co.; Part IV, by W. H. FULWEILER, Chemical Engineer, United Gas Improvement Co.

"History and Development of A.S.T.M. Tests and Specifications for Timber," by J. A. NEWLIN, Chief, Section on Timber Mechanics, U. S. Forest Products Laboratory.

"The Abrasion Test as a Criterion of the Toughness of Rubber Compounds," by F. G. BREYER, Consulting Engineer, Singmaster and Breyer, and H. A. DEPEW, Research Division, New Jersey Zinc Co.

"Recent Developments in the Testing of Refractories," by M. C. BOOZE, Vice-President, Charles Taylor Sons Co.

The following members of the Society have indicated their intention of attending the Congress: D. A. ABRAMS, E. C. BAIN, E. C. BINGHAM, V. L. CHECHOT, W. A. COWAN, W. H. FULWEILER, M. A. GROSSMAN, H. C. LOUDENBECK, F. F. LUCAS, T. D. LYNCH, P. H. WALKER and A. E. WHITE.

The Executive Committee has appointed two official delegates from the Society: Vice-President T. D. LYNCH and Past-President W. H. FULWEILER. These delegates will represent the Society at a plenary session at which will be discussed (1) the time and place of the next congress and (2) the field in which international cooperation can be established in the future. The discussions may include the possibility of reorganizing the International Association for Testing Materials.

Use of A.S.T.M. Specifications in Market Quotations in Trade Papers

Apropos of the discussions that have taken place recently in the Society on making more definite use of A.S.T.M. standards, mention should be made of an article by G. H. Clamer appearing in *Daily Metal Trade* in June, calling attention to the inadequate method of describing non-ferrous metals in giving market quotations. In this article, Mr. Clamer stated that in glancing over the quotations given in publications for all kinds of metal products (and no doubt this would refer in general to all materials of engineering) it is evident that there is no attempt at accurate designation of quality upon which quotations are based. "The editor," Mr. Clamer states, "very carefully quotes from day to day changes in price amounting to one-eighth cent per pound, and sometimes even less. He ignores the fact that an alloy in ingot form may be good, bad or indifferent, and varying in cost of production to the extent of one-half cent per pound or more (new metal mixture excluded), depending on the degree of refining as reflected in the full analysis, including impurities."

Mr. Clamer suggests as a possible remedy, basing quotations on definite specifications. For example, the mixture commonly designated as 85-5-5-5 might be ordered under A.S.T.M. Specifications for Bronze Bearing Metal (B 31-21). Quotations on the alloy 80-10-2 might be based on A.S.T.M. Specifications B 10-18. By adhering to these and similar specifications and seeing that any metal purchased conformed to them, the purchaser would have a far better idea of the nature of the metal for which quotations are given.

The *Daily Metal Trade* followed the publication of this article by a series of comments by W. M. Rooney, Associate Editor of the paper, which called attention to the present disorganized state of the non-ferrous industry, and suggested that some concerted action would be necessary on the part of the producers to fix on the basis on which quotations should be made, before any departure could be made from the present system of quotations. There was at present no agreement as to the specifications that should apply and it was accordingly evident that the brass ingot industry needs more definite understanding as to what tolerances are in keeping with good business practice. Further, that the consumers must be educated to the economy of using only specification material. Many producers at present are indifferent to specifications, and price usually is the dominating influence on the part of consumers in placing orders. Large consumers do not enforce specifications rigidly and this tends to keep a large amount of off-grade metal on the market. Mr. Rooney suggested the possibility of initiating a movement to educate consumers to the necessity of paying more attention to the quality of metal purchased and the establishment of definite standards.

This same question was discussed at a recent meeting of Committee B-2 on Non-Ferrous Metals and Alloys at which it was recommended that in view of the lack of definiteness in the description of non-ferrous metals and alloys used in trade publications in quoting market prices, this subject be investigated. If the subject warranted, a committee should be organized, as proposed in Mr. Clamer's article, whose function would be to study the possibility of using, in so far as possible, A.S.T.M. specifications and nomenclature in describing metals or alloys quoted upon. This same procedure could perhaps be broadened to apply to all metals and in fact to other materials of engineering, as well. Should the committee be organized, the trade papers should be represented in the personnel.

Society Invited to Aberdeen Proving Ground

Members of the Society are being invited to the Ninth Annual Meeting of the Army Ordnance Association to be held at Aberdeen Proving Ground, Maryland, Thursday, October 6. The plans announced indicate that the affair will be one of the most interesting demonstrations of military equipment since the World War. These annual meetings of the Association attract increasing interest from year to year because of their appeal not only to American citizens interested in the military phases of national defense but also because of their instructive value to executives and engineers of American industry.

This year the meeting will include demonstrations of practically every type of American ordnance, beginning with the giant 16-in. gun and ranging down to the smallest rifles and pistols.

Through the cooperation of the various branches of the Army, demonstrations will also be given by the Chemical Warfare Service, the Air Corps, the Signal Corps, Field Artillery, Coast Artillery and Quartermaster Corps.

The program includes anti-aircraft firings at a target towed by an airplane, intended to show the remarkable strides which have been made both in the improvement of anti-aircraft guns and fire control instruments and also in the training of personnel.

A new feature of the meeting this year will be the serving of all meals by the Quartermaster Corps. Under the supervision of the Quartermaster General of the Army, elaborate arrangements are being made for handling the great crowds which attend the meetings, and real Army meals in Army style will be served.

Ordnance day at Aberdeen is one of continuous demonstrations beginning at 10 A. M. and concluding at about 7.30 P. M. It is not a day of speeches and papers but an occasion when the Army brings forth in continuous procession the weapons and equipment which have enabled it to reach its present high state of efficiency.

The day goes like clock work, with one event following immediately upon another, a demonstration of big guns in action, the big army bombing planes dropping demolition bombs, parachute jumps and the rest. The demonstrations will take place at various places of the 70,000-acre Proving Ground, and will include the automotive equipment, big and little tanks, tractors hauling huge howitzers, cross-country cars, cargo trucks. Now and then a band concert, a good supper, and more anti-aircraft night firings when the giant searchlights pick up the tiny targets in the clouds and the guns bark their salvos at the make-believe invaders.

And behind it all is the one big thought that the Army wants your cooperation. It wants you to have at least a speaking acquaintance with the big guns and the tanks and the rest because American industry had to throw all its resources toward making them in 1918 and it took twice as long as it should have taken. Hope as we will that we will never have to make them in quantity production again, the idea of being prepared is as sound as it is old and Industrial Preparedness—the big idea of the Army Ordnance Association at the Aberdeen meeting—is more than half the job. So reserve Thursday, October 6, 1927, for Aberdeen—a big day with a big moral.

Personal invitations and complete details will be sent by the Army Ordnance Association to all members of the Society about September 1.

New Tentative Standards

Forty-five new tentative standards, including specifications, methods of test and definitions, were accepted for publication:

Metals:

- Specifications for Structural Steel for Cars and Locomotives.
- Specifications for Marine Boiler Steel Plates.
- Specifications for Alloy Tool Steel.
- Specifications for Zinc-Coated (Galvanized) Wire Fencing.
- Specifications for Zinc-Coated Chain-Link Fence Fabric Galvanized After Weaving.
- Specifications for Zinc-Coated Chain-Link Fence Fabric Galvanized Before Weaving.
- Specifications for Brazing Solder.
- Specifications for Yellow Brass Sand Castings for General Purposes.
- Specifications for Bronze Castings in the Rough for Locomotive Wearing Parts.
- Specifications for Car and Tender Journal Bearings, Lined.
- Specifications for Copper Tubing for Refrigerators.
- Specifications for Rolled Zinc.
- Methods of Test for Magnetic Properties of Iron and Steel at Low Inductions for Audio and Power Frequencies.
- Method of Test for Change of Resistance with Temperature of Metallic Materials for Electrical Heating.
- Methods of Chemical Analysis of Metallic Materials for Electrical Heating.
- Definitions of Terms Relating to Heat Treatment Operations.

Brick and Refractories:

- Specifications for Paving Brick.
- Specifications for Building Brick (Made from Clay or Shale).
- Specifications for Clay Fire Brick for Malleable Furnaces with Removable Bungs and for Annealing Ovens.
- Specifications for Clay Fire Brick for Stationary Boiler Service.
- Specifications for Clay Fire Brick for Marine Boiler Service.
- Methods of Testing Brick.
- Definitions of Terms Relating to Refractories.

Aggregates:

- Specifications for Sand for Use in Lime Plaster.
- Method of Test for Field Determination of Approximate Apparent Specific Gravity of Fine Aggregate.
- Method of Test for Field Determination of Approximate Percentage of Voids in Fine Aggregate.
- Method of Test for Field Determination of Surface Moisture in Fine Aggregate.

Paints and Oils:

- Specifications for Boiled Linseed Oil.
- Specifications for Prussian Blue.
- Specifications for Ultramarine Blue.
- Specifications for Chrome Oxide Green.
- Specifications for Commercial Para Red.
- Specifications for Titanium Barium Pigment.
- Specifications for Aluminum Powder for Paints.
- Specifications for Gold Bronze Powder.
- Methods of Test for Determination of Wax in Shellac ("Machine-Made" and Dry Refined Bleached Shellac).
- Methods of Sampling and Testing Lacquer Solvents and Diluents.
- Method of Test for Determination of Toluol Insoluble Matter in Rosin (Chiefly Sand, Chips, Dirt and Bark).
- Methods of Sampling Petroleum and Petroleum Products.

Coal and Coke:

- Methods for the Determination of Sulfur in Coal and Coke by the Bomb-Washing and Sodium Peroxide Fusion Methods.

Waterproofing:

- Methods of Analysis of Roofing Felt for Fiber Composition.

Slate:

- Methods of Test for Determining the Insulating Qualities of Slate.

Textile Materials:

- Specifications for Tolerances and Test Methods for Certain Light and Medium Cotton Fabrics.
- Specifications and Tests for Cuban (Jute) Raw Sugar Bags.
- Methods for Identification of Textile Fibers and Their Quantitative Determination in Mixed Goods.

These tentative standards will appear in Part I of the Proceedings for this year and in the 1927 Book of A.S.T.M. Tentative Standards.

AMERICAN SOCIETY FOR TESTING MATERIALS

BULLETIN

Issued Bi-Monthly

Engineers' Club Building, 1315 Spruce St., Philadelphia, Pa.

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Number 27

July 30, 1927

Twenty-five Years

TWENTY-FIVE years in retrospect! Twenty-five years in prospect! With the commemoration at the recent annual meeting of the twenty-fifth anniversary of the incorporation of the Society it was but natural to review the first quarter century of the Society's existence. Much has been accomplished in that time—much has been learned. Above all, it has been established that there has been and is a real place in the economic structure of the country for the A.S.T.M., and that the founders were amply justified in organizing a new Society twenty-five years ago.

Otherwise there would not have been the hearty support that has been accorded the Society in these years, nor would there have been the steady growth in membership from 175 in 1902 to well over 4000 in 1927. Nor would there have been the enthusiasm of those who have done such splendid work on the committees. Aside from purely investigational work that has resulted in much valuable information being made available to industry, there have been the more concrete results of practical and useful standard specifications and methods of test. The number of these has grown to the impressive figure of 340. In addition there are 175 tentative standards, a total of 515 specifications and methods.

But what of the next twenty-five years? Will the Society continue to grow both in membership and influence as it has in the past? We believe it will, for there are many whose interests lie in the field of the Society's work who are just beginning to appreciate its existence. There are still other fields in the study of engineering materials that require the same intensive scientific study given to those now covered by the Society. Requests are constantly being received that work be undertaken in new fields where often some group has made a start but feels that the work could be handled to better advantage under the Society's auspices. With the inspiration of the past twenty-five years to guide us there is every reason to look forward to another twenty-five years of equal service and of equal accomplishments.

The Spirit of Research in the A.S.T.M.

To some persons, the term "research" conveys the idea of experimental studies in unexplored fields of science, such work as the X-ray studies of the constitution of matter, which were so brilliantly discussed by Doctor Clark in this year's Marburg Lecture. To others, especially to committees or other organized groups, research means the correlating of discoveries in partially explored fields, and the systematizing and codifying of the correlated work. An example of the second kind of research is furnished by the long and fruitful work of our Committee C-6 on Drain Tile. The writer believes that it is a mistake to think of these two types of research in terms of "higher" and "lower"—each type is equally necessary to the advancement of the knowledge of materials.

The direct importance of research work in the Society is obvious. The indirect results of a spirit of research are less obvious, but, perhaps, equally important. A recent editorial in the *Engineering News-Record* in commenting on our recent "silver wedding" anniversary contained this paragraph:

"... There is a change from the condition of former years, when the parties engaged in the discussion of specifications were two sharply distinct classes, steel maker and engineer, for example. To-day, the discussions are between producing industry and using industry, equally powerful interests but equally sober-minded in trying to seek the best adjustment of their joint problem."

If this judgment of one phase of our Society work is true, it means that the spirit of research, an intellectual curiosity to find out the truth, has become a large factor in our specification work, as well as in our distinctively research work. Let us see to it that this research spirit pervades all our Society activities.



President

G. W. Thompson Honored by Armour Institute

Dr. G. W. Thompson, Chief Chemist of the National Lead Co. and Senior Vice-President of the Society, delivered the graduation address at the commencement exercises at the Armour Institute, Chicago, Thursday, June 9. We are very pleased to announce that in conjunction with the exercises the degree of Doctor of Science was conferred upon Doctor Thompson.

Doctor Thompson is a Fellow of the American Association for the Advancement of Science, and a member of the American Chemical Society, the Society of Chemical Industry, the Chemists' Club of New York, the Metal and Rubber Club, as well as our own Society. He is Past-President of the American Society of Chemical Engineers.

Past-President Farmer Signally Honored

Mr. F. M. Farmer, Chief Engineer of the Electrical Testing Laboratories and Past-President of the Society, has been honored for a paper on "Tests of Paper-Insulated High-Tension Cable" presented before the American Institute of Electrical Engineers, in May, 1926. The committee on awards reported to the board of directors of the Institute that this paper was the one chosen as the "National Best Paper" and also the "Best Regional Paper" for the year 1926. An award is granted annually by the Institute for each of these papers separately, but in this case the one paper won both awards.

Amendment of By-Laws Referred to Ballot

At the recent annual meeting, the Executive Committee, by unanimous vote, was authorized to refer to letter ballot of the Society the following amendments of the By-laws:

Amend Article VII, Section 1, to read as follows by the insertion of the italicized words and the omission of the words in brackets:

"Section 1. The fiscal year shall commence on the first day of January. *The annual dues, payable in advance, shall be as follows: For Members that are companies, firms, corporations, industrial associations or commercial testing laboratories, \$30; for all other Members, \$15; for Junior Members, \$7.50; for Student Members, \$3.* [The annual dues shall be \$15 for Members, \$7.50 for Junior Members and \$3 for Student Members, payable in advance.] Honorary Members shall not be subject to dues."

Amend the last sentence of Article VII, Section 3, to read as follows by the insertion of the italicized words and the omission of the words in brackets:

"The cost of membership in perpetuity to *companies, firms, corporations, industrial associations and commercial testing laboratories shall be \$600; to other organizations, \$300.* [corporations, firms, technical or scientific societies, teaching faculties or libraries shall be \$300.]"

As explained in the report of the Executive Committee and in previous issues of the BULLETIN, these recommendations have been based upon a careful study of the needs of the Society for greater income to carry on its work more effectively and assumes that the industrial and commercial value of the work to companies and corporations, both directly and indirectly, is so great as to justify the increased financial support that is requested from industry.

It is pointed out that the whole proposal is upon a voluntary basis in that companies that may not wish to give this increased support to the Society's work can still continue their affiliation with the Society by transferring their membership to an individual in the company. At the same time it is believed that there will be many individual members of the Society who will be willing to have the membership carried in the name of their company in order to accord greater financial support to the Society's work.

Forthcoming Society Publications

Year Book.—The 1927 Year Book, about 400 pages, containing the charter and By-laws, the list of members, geographical distribution of members, personnel of standing committees and list of standards and tentative standards, is now in course of preparation. This volume will be ready for distribution to all members about September 10.

1927 Book of A.S.T.M. Standards.—The 1927 Book of A.S.T.M. Standards will be published in two parts, Part I containing the standards of the Society relating to metals, and Part II the standards relating to non-metallic materials. The two parts will comprise approximately 1850 pages and will contain all of the standards of the Society (340) in their latest revised form. The volumes should be ready for distribution about October 15.

Book of A.S.T.M. Tentative Standards.—The Society will again issue a volume containing all of the tentative standards of the Society (175) in their latest revised form. Although the current Proceedings contain the new and revised tentative standards, many members find it a convenience to have a compilation of all tentative standards bound in one cover. The value and popularity of the volume is shown by the ever-increasing demand. Each new member, as he qualifies, is furnished with a copy of this publication. The 1927 Book should be available about October 15.

Proceedings.—The publication of the Proceedings of the recent annual meeting containing committee reports, new and revised standards, technical papers and discussions, will be taken in hand as promptly as possible. It is expected that distribution to members in good standing will be completed in December. The size of Parts I and II of the Proceedings will aggregate approximately 1800 pages.

Matters Referred to Letter Ballot

By action of the annual meeting, 57 revisions of existing standards and 95 tentative standards were referred to letter ballot vote of the membership of the Society for adoption as standard. Full information concerning all matters referred to letter ballot is given in the preprints of the committee reports issued to the members in advance of the meeting, in the account of the annual meeting appearing in this BULLETIN and in the Summary of the Proceedings. Two amendments to the By-laws, given in detail in the adjoining article and in the Summary of the Proceedings, were also referred to letter ballot of the Society:

Article VII. Dues:

1. Revision of Section 1.
2. Revision of Section 3.

Revisions of Existing Standards

Standard Specifications for:

- Boiler and Firebox Steel for Stationary Service (A 70-24), recommended by Committee A-1.
- Carbon-Steel Bars for Railway Springs (A 14-16), recommended by Committee A-1.
- Carbon-Steel Bars for Railway Springs with Special Silicon Requirements (A 68-18), recommended by Committee A-1.
- Carbon-Steel Bars for Vehicle and Automobile Springs (A 58-16), recommended by Committee A-1.
- Silico-Manganese-Steel Bars for Automobile and Railway Springs (A 59-16), recommended by Committee A-1.
- Chrome-Vanadium-Steel Bars for Automobile and Railway Springs (A 60-16), recommended by Committee A-1.
- Carbon-Steel and Alloy-Steel Forgings (A 18-21), recommended by Committee A-1.
- Quenched-and-Tempered Carbon-Steel Axles, Shafts, and Other Forgings for Locomotives and Cars (A 19-21), recommended by Committee A-1.
- Quenched-and-Tempered Alloy-Steel Axles, Shafts, and Other Forgings for Locomotives and Cars (A 63-21), recommended by Committee A-1.
- Carbon-Steel Forgings for Locomotives (A 20-21), recommended by Committee A-1.
- Lap-Welded and Seamless Steel and Lap-Welded Iron Boiler Tubes (A 83-24), recommended by Committees A-1 and A-2.
- Welded and Seamless Steel Pipes (A 53-24), recommended by Committee A-1.
- Alloy-Steel Bolting Material for High-Temperature Service (A 96-26), recommended by Committee A-1.
- Welded Wrought-Iron Pipe (A 72-24), recommended by Committee A-2.
- Staybolt, Engine-Bolt and Extra-Refined Wrought-Iron Bars (A 84-24), recommended by Committee A-2.
- Merchant Bar Iron (A 85-24), recommended by Committee A-2.
- Malleable Castings (A 47-24), recommended by Committee A-7.
- Lake Copper Wire Bars, Cakes, Slabs, Billets, Ingots, and Ingot Bars (B 4-13), recommended by Committee B-2.
- Electrolytic Copper Wire Bars, Cakes, Slabs, Billets, Ingots, and Ingot Bars (B 5-13), recommended by Committee B-2.
- Hard-Drawn Copper Wire (B 1-23), recommended by Committee B-1.
- Medium Hard-Drawn Copper Wire (B 2-15), recommended by Committee B-1.
- Soft or Annealed Copper Wire (B 3-15), recommended by Committee B-1.
- Bare Concentric-Lay Copper Cable: Hard, Medium-Hard, or Soft (B 8-21), recommended by Committee B-1.
- Round and Grooved Hard-Drawn Copper Trolley Wire (B 47-25), recommended by Committee B-1.
- Naval Brass Rods for Structural Purposes (B 21-19), recommended by Committee B-2.
- High Sheet Brass (B 36-21), recommended by Committee B-2.
- Gypsum Plasters (C 28-21), recommended by Committee C-11.
- Gypsum Partition Tile or Block (C 52-25), recommended by Committee C-11.
- Specifications and Tests for Hollow Burned-Clay Load-Bearing Wall Tile (C 34-26), recommended by Committee C-10.
- Ocher (D 85-24), recommended by Committee D-1.
- Woven Cotton Fabrics Saturated with Bituminous Substances for Use in Waterproofing (D 173-25), recommended by Committee D-8.
- Imperfections and Tolerances for Square-Woven Tire Fabric (D 122-25), recommended by Committee D-13.
- Imperfections and Tolerances for Cord Tire Fabrics (D 179-25), recommended by Committee D-13.
- Specifications and Tests for Osnaburg Cement Sacks (D 205-25), recommended by Committee D-13.

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Matters Referred to Letter Ballot

(Continued from page 7)

Standard Methods of:

- Sampling and Chemical Analysis of Pig and Cast Iron (A 64 - 16), recommended by Committee A-3.
- Chemical Analysis of Brass Ingots and Sand Castings (B 45 - 23), recommended by Committee B-2.
- Chemical Analysis of Bronze Bearing Metal (B 46 - 23), recommended by Committee B-2.
- Test for Unit Weight of Aggregate for Concrete (C 29 - 21), recommended by Committee C-9.
- Test for Organic Impurities in Sands for Concrete (C 40 - 22), recommended by Committee C-9.
- Making and Storing Specimens of Concrete in the Field (C 31 - 21), recommended by Committee C-9.
- Making Compression Tests of Concrete (C 39 - 25), recommended by Committee C-9.
- Testing Gypsum and Gypsum Products (C 26 - 23), recommended by Committee C-11.
- Test for Specific Gravity of Pigments (D 153 - 24), recommended by Committee D-1.
- Routine Analysis of White Pigments (D 34 - 17), recommended by Committee D-1.
- Routine Analysis of Dry Red Lead (D 49 - 18), recommended by Committee D-1.
- Routine Analysis of Yellow, Orange, Red and Brown Pigments Containing Iron and Manganese (D 50 - 18), recommended by Committee D-1.
- Routine Analysis of Yellow and Orange Pigments Containing Chromium Compounds, Blue Pigments and Chrome Green (D 126 - 23), recommended by Committee D-1.
- Routine Analysis of Titanium Pigments (D 186 - 25), recommended by Committee D-1.
- Test for Water in Petroleum Products and Other Bituminous Material (D 95 - 24), recommended by Committee D-2.
- Mechanical Analysis of Sand or Other Fine Highway Material, Except Fine Aggregates Used in Cement Concrete (D 7 - 18), recommended by Committee D-4.
- Test for Loss on Heating of Oil and Asphaltic Compounds (D 6 - 20), recommended by Committee D-4.
- Laboratory Sampling and Analysis of Coal (D 22 - 24), recommended by Committee D-5.
- Laboratory Sampling and Analysis of Coke (D 37 - 24), recommended by Committee D-5.
- Testing Molded Insulating Materials (D 48 - 24), recommended by Committee D-9.
- Testing Cotton Fabrics (D 39 - 24), recommended by Committee D-13.
- Metallographic Testing of Non-Ferrous Metals and Alloys (E 5 - 24), recommended by Committee E-4.

Standard Definitions of:

- Terms Relating to Wrought-Iron Specifications (A 81 - 21), recommended by Committee A-2.

Tentative Standards to be Adopted as Standard

Tentative Specifications for:

- Open-Hearth Carbon-Steel Rails (A 1 - 26 T), revised as recommended by Committee A-1.
- The Manufacture of Open-Hearth Steel Girder Rails of Plain, Grooved and Guard Types (A 2 - 26 T), recommended by Committee A-1.
- Low-Carbon Steel Track Bolts (A 76 - 20 T), revised as recommended by Committee A-1.
- Structural Silicon Steel (A 94 - 25 T), recommended by Committee A-1.
- Steel Plates of Structural Quality for Forge Welding (A 78 - 23 T), revised as recommended by Committee A-1.
- Steel Plates of Flange Quality for Forge Welding (A 89 - 23 T), revised as recommended by Committee A-1.
- Cold-Drawn Steel Wire for Concrete Reinforcement (A 82 - 21 T), revised as recommended by Committee A-1.
- Carbon-Steel Car and Tender Axles (A 21 - 25 T), revised as recommended by Committee A-1.
- Carbon-Steel Castings for Railroads (A 87 - 22 T), revised as recommended by Committee A-1.
- Commercial Quality Hot-Rolled Bar Steels (A 107 - 26 T), revised as recommended by Committee A-1.
- Commercial Cold-Finished Bar Steels and Cold-Finished Shafting (A 108 - 26 T), revised as recommended by Committee A-1.
- Hot-Dipped Galvanized Sheets (A 93 - 24 T), revised as recommended by Committee A-5.
- Hollow Staybolt Iron (A 86 - 25 T), revised as recommended by Committee A-2.
- Tungsten Powder (A 97 - 25 T), recommended by Committee A-9.
- Spiegeleisen (A 98 - 25 T), recommended by Committee A-9.
- Ferro-Manganese (A 99 - 25 T), recommended by Committee A-9.

- Ferro-Silicon (A 100 - 25 T), recommended by Committee A-9.
- Ferro-Chromium (A 101 - 25 T), recommended by Committee A-9.
- Ferro-Vanadium (A 102 - 25 T), recommended by Committee A-9.
- Phosphor Tin (B 51 - 24 T), recommended by Committee B-2.
- Phosphor Copper (B 52 - 24 T), recommended by Committee B-2.
- Silicon Copper (B 53 - 24 T), recommended by Committee B-2.
- Soft Rectangular Copper Wire (B 48 - 26 T), recommended by Committee B-1.
- Manganese-Bronze Ingots for Sand Castings (B 7 - 24 T), recommended by Committee B-2.
- Manganese-Bronze Sand Castings (B 54 - 24 T), recommended by Committee B-2.
- Muntz Metal Condenser Tube Plates (B 57 - 25 T), recommended by Committee B-2.
- Quicklime for Use in the Manufacture of Sulfit Pulp (C 46 - 25 T), recommended by Committee C-7.
- Hydrated Lime for the Manufacture of Varnish (C 47 - 22 T), recommended by Committee C-7.
- Quicklime for Use in Water Treatment (C 53 - 25 T), recommended by Committee C-7.
- Hydrated Lime for Use in Water Treatment (C 54 - 25 T), recommended by Committee C-7.
- Specifications and Tests for Hollow Burned-Clay Floor Tile (C 57 - 26 T), revised as recommended by Committee C-10.
- Raw Linseed Oil (D 234 - 26 T), revised as recommended by Committee D-1.
- Destructively Distilled Wood Turpentine (D 236 - 26 T), revised as recommended by Committee D-1.
- Orange Shellac (D 237 - 26 T), recommended by Committee D-1.
- Iron Oxide and Iron Hydroxide (D 84 - 25 T), revised as recommended by Committee D-1.
- Chrome Yellow (D 211 - 26 T), revised as recommended by Committee D-1.
- Pure Chrome Green (D 212 - 26 T), revised as recommended by Committee D-1.
- Reduced Chrome Green (D 213 - 26 T), revised as recommended by Committee D-1.
- Broken Slag for Bituminous Macadam Base (D 195 - 24 T), recommended by Committee D-4.
- Broken Slag for Bituminous Concrete Base (D 196 - 24 T), recommended by Committee D-4.
- Broken Slag for Bituminous Macadam Wearing Course (D 159 - 24 T), recommended by Committee D-4.
- Broken Slag for Bituminous Concrete (Coarse-Graded Aggregate Type) (D 160 - 24 T), recommended by Committee D-4.
- Broken Slag for Bituminous Concrete (Fine-Graded Aggregate Type) (D 161 - 24 T), recommended by Committee D-4.
- Structural Joist, Planks, Beams, Stringers and Posts (D 245 - 26 T), revised as recommended by Committee D-7.
- High-Carbon Coal-Tar Pitch for Use in Constructing Built-Up Roofs Surfaced with Slag or Gravel (D 251 - 26 T), recommended by Committee D-8.
- High-Bitumen Coal-Tar Pitch for Use in Constructing Built-Up Roofs Surfaced with Slag or Gravel (D 252 - 26 T), recommended by Committee D-8.
- Asphalt Roll-Roofing Surfaced with Powdered Talc (D 224 - 26 T), recommended by Committee D-8.
- Slate-Surfaced Asphalt Roll-Roofing and Slate-Surfaced Asphalt Shingles (D 225 - 26 T), recommended by Committee D-8.
- Asphalt Roll-Roofing Surfaced with Granular Talc (D 248 - 26 T), recommended by Committee D-8.
- Heavy Weight Slate-Surfaced Asphalt Roll-Roofing and Heavy Weight Slate-Surfaced Asphalt Shingles (D 249 - 26 T), recommended by Committee D-8.
- Asphalt-Saturated Roofing Felt for Use in Waterproofing and in Constructing Built-Up Roofs (D 226 - 26 T), recommended by Committee D-8.
- Coal-Tar Saturated Roofing Felt for Use in Waterproofing and in Constructing Built-Up Roofs (D 227 - 26 T), recommended by Committee D-8.
- Asphalt-Saturated Asbestos Felt for Use in Constructing Built-Up Roofs (D 250 - 26 T), revised as recommended by Committee D-8.
- Textile Testing Machines (D 76 - 25 T), recommended by Committee D-13.
- Tolerances and Test Methods for Cotton Yarns, Single and Plied (D 180 - 25 T), recommended by Committee D-13.
- Tolerances and Test Methods for Cotton Sewing Threads (D 204 - 25 T), recommended by Committee D-13.
- Tolerances for Numbered Cotton Duck (D 230 - 25 T), recommended by Committee D-13.
- Tolerances and Test Methods for Electrical Silk and Cotton Tapes (D 259 - 26 T), recommended by Committee D-13.

Tentative Methods of:

- Test for Magnetic Properties of Iron and Steel (A 34 - 26 T), revised as recommended by Committee A-6.

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COMMITTEE ACTIVITIES

Space in the BULLETIN is reserved for items of interest about committee activities. Officers of committees are invited to prepare information of suitable character for publication.

Sectional Committee on Classification of Coal

An important step in placing the purchase and utilization of coal on a scientific basis was taken recently in the organization of a sectional committee, for which the Society is sponsor under the rules of procedure of the A.E.S.C., for the classification of coal. Coal is a complex and highly valuable material, commercially produced in this country from some ten thousand mines, the product varying greatly in chemical composition and in physical behavior under different conditions of use. It is no longer simply a fuel but has become a chemical raw material. This is recognized in that a fuel research laboratory has been established in every civilized nation in the World. The experimental data being obtained cannot be scientifically correlated and utilized until a rational system of classification is adopted. The development of such a system is the problem assigned to the newly organized sectional committee.

While the coal situation is quite complex and offers many difficulties to a satisfactory classification it is felt that scientific and practical knowledge of coal has now reached the point where an acceptable and really useful classification can be devised. This should prove of general benefit to the coal industry since it will eliminate the present confusion of data now available. When producers are given authoritative information on the requirements of fuel for each special use they will be able to direct their coal into the most valuable channels. When the consumers learn how to evaluate coals for their particular needs they will be able to broaden their source of supply with a minimum of costly "cut-and-try" experimentation. Furthermore, a standard classification should add much to eliminate dispute and litigation in the case of freight rates and import duties.

The sectional committee was formally organized on June 10, and consists of representatives of the various industries concerned. Mr. A. C. Fieldner, Chief Engineer, Division of Mining Experiment Stations, U. S. Bureau of Mines, Washington, D. C., was elected chairman and W. R. Addicks, Senior Vice-President, Consolidated Gas Co. of New York, vice-chairman. The secretarial work will be handled by H. L. Gandy, Secretary of the National Coal Association. The complete personnel of the sectional committee is as follows:

Organizations	Representatives
American Ceramic Society.....	W. H. Fulweiler
American Chemical Society.....	S. W. Parr
American Electric Railway Assn.....	H. A. Kidder
	A. E. Ellis, alt.
American Gas Assn.....	W. R. Addicks
American Inst. Mining and Metallurgical Engrs.....	H. J. Rose
American Mining Congress.....	W. R. Roberts
	H. M. Payne, alt.
American Society of Mechanical Engrs.....	F. R. Wadleigh
American Society for Testing Mats.....	A. C. Fieldner
American Wholesale Coal Assn.....	Arthur Kuppinger
Anthracite Operators Conference.....	(To be appointed)
Association of State Geologists.....	G. H. Ashley
	M. M. Leighton
	H. E. Culver
Coal Mining Inst. of America.....	W. E. Fohl
International Railway Fuel Assn.....	Malcolm Macfarlane
National Assn. of Purchasing Agents.....	T. W. Harris
National Coal Association.....	W. H. Cunningham
	H. N. Eavenson
	H. M. Ferguson

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Schedule of Committee Meetings

DATE	COMMITTEE	PLACE
September	C-1 on Cement	Easton, Pa.
October	D-16 on Slate	Easton, Pa.
October 11	Executive Committee.....	Philadelphia
October 27-28	D-9 on Electrical Insulating Materials	Rochester, N. Y.
October.....	E-9 on Correlation of Re- search	Philadelphia

No Group Meeting This Fall

Last year the regular fall group meeting of A.S.T.M. committees was cancelled since a number of committees found it inconvenient to participate in a group meeting at that time, the regular spring group meeting, however, being held as usual. This year it again seems advisable not to arrange for any fall group committee meeting. A number of committees have discontinued holding a meeting of the entire committee in the fall, holding instead a planning meeting of the advisory committee or sub-committee meetings.

We look forward, however, to the group meeting next spring, in which it is expected that a considerable number of our committees will be able to participate, as was the case in March of this year, which turned out to be the largest and most successful group meeting yet held.

Committee Notes

Committee A-2 on Wrought Iron at the recent annual meeting elected as chairman Mr. H. W. Faus, Engineer of Tests, New York Central Lines, New York City, to fill the vacancy created by the resignation of Mr. H. J. Force.

Committee A-9 on Ferro Alloys has now advanced to standard its methods for sampling ferro alloys, which methods cover the sampling of the less valuable alloys. These methods, however, are not adapted to the more valuable alloys, such as ferro-molybdenum, ferro-tungsten and ferro-vanadium, and the committee is now at work on methods of sampling these alloys.

Samples of tungsten powder and ferro-tungsten have now been prepared at the Bureau of Standards and that organization, together with cooperative analysts, are at work with a hope to submit tentative methods of analysis next year.

The committee recently elected as chairman Mr. N. B. Hoffman, Chemist and Metallurgist, Colonial Steel Co., Pittsburgh, Pa., to succeed Mr. F. C. Langenberg, who had resigned as chairman because of his recent change of business connections, transferring him from non-producer to producer.

Committee C-10 on Hollow Masonry Building Units has completed much of its work in developing specifications for hollow tile. It has adopted as standard, specifications for hollow, burned-clay, load-bearing wall tile and for hollow, burned-clay, load-bearing floor tile, and as tentative, specifications for hollow, burned-clay fire-proofing, partition and furring tile. The committee is not entirely satisfied with the requirements for weathering of hollow tile in that only a small amount of data has been obtained on which such requirements could be based. It has instructed its Sub-Committee on Weathering to carry on further work, cooperating with a similar subcommittee of Committee C-3 on Brick.

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Committee Notes

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Committee C-11 on Gypsum is now at work on the preparation of specifications for gypsum fiber concrete. Numerous tests have been conducted from time to time by members of the committee but the data obtained have never been correlated. Further tests are being conducted at the Bureau of Standards on the various mixes employed. The information developed will be used in the preparation of specifications for structural gypsum products.

Committee D-17 on Naval Stores held a well-attended meeting during the recent annual meeting at French Lick. The committee recommended a new tentative method for the determination of toluol insoluble material in rosin, which was accepted by the Society. The committee outlined at its meeting the work it hopes to accomplish during the coming year, which is to be confined to the study of methods for the determination of so-called "melting point" of rosin.

Committee E-4 on Metallography is considering a study of the fiber of steel, with a view to formulating a standard definition of this term, and has also in view some further work on thermal analysis. The sub-committee on X-ray crystal analysis has been active and expects to have a further report on this subject during the coming year.

Society Appointments

Announcement is made of the following appointments:

F. M. Waring, Engineer of Tests, Pennsylvania Railroad System, Altoona, Pa., as the Society's representative on the Research Committee, of the National Safety Council, on Effect of Annealing on Chains.

F. M. Farmer, Chief Engineer, Electrical Testing Laboratories, New York City, and C. L. Warwick, Secretary-Treasurer, American Society for Testing Materials, Philadelphia, Pa., as the Society's representatives on the Advisory Board of Museums of the Peaceful Arts.

H. H. Quimby, Consulting Bridge Engineer, Philadelphia, Pa., on a special committee of the National Committee on Metals Utilization considering the simplified practice recommendations for reinforcement bars.

Special Committee Reprints

Several committees of the Society have found it to advantage to get out special reprints, either of the report of the committee as presented at the recent annual meeting or a compilation of the various standards and tentative standards that have been developed by that committee. These reprints have a special value, in that they make available in convenient form the standards applying to a given field. These pamphlets are now in press, as follows:

Reprint of the 1927 Report of **Committee A-5 on Corrosion of Iron and Steel** (72 pages, 5 insert plates), containing the results of the atmospheric corrosion tests on copper-bearing and non-copper-bearing sheets, results of total immersion tests on the same material, and an outline of an extensive investigation on atmospheric corrosion tests of galvanized material. Single copies, 75 cents.

A pamphlet (224 pages) containing the 1927 Report of **Committee D-2 on Petroleum Products and Lubricants**, together with 26 standard and 15 tentative methods of test relating to petroleum and petroleum products. Single copies, \$1.00.

A pamphlet (130 pages) containing the 1927 Report of **Committee D-9 on Electrical Insulating Materials**, together with 2 standard and 10 tentative methods of test relating to electrical insulating materials. Single copies, 80 cents.

A pamphlet (100 pages) containing all of the standard and tentative specifications and methods of test of the Society relating to textile materials and data relative thereto, and information concerning **Committee D-13 on Textile Materials**. Single copies, 75 cents.

Corrosion of Metal Culverts

In the last issue of the BULLETIN, announcement was made of the organization of a new sub-committee, of Committee A-5 on Corrosion of Iron and Steel, to study the corrosion of metal culverts and to determine which materials are the most satisfactory in service. As a first step the sub-committee will seek to assemble the results of service tests that may have already been carried out. The state highway departments and the railroads represent the large consumers of culverts. Many of these have had considerable experience with the service of various culverts and data already at hand as a result of this experience will be sought by getting in touch with these several groups. A questionnaire will be sent out to determine what information is available on the relative durability of corrugated metal pipe culverts as influenced by variations in type of base metal, character of drainage water, soil characteristics or other factors.

With this data at hand the need for further tests can be determined. Information is already being obtained as to where tests might be carried out to advantage for the purpose of securing further data on the relative behavior of culvert metals.

While the immediate work is confined to a study of the corrugated flexible metal culvert, the committee has in mind that later on it may take up the study of the cast-iron culvert, which is the only other type of culvert which falls under its jurisdiction.

Sectional Committee on Numbering of Steels

The Sectional Committee on Numbering of Steels recently submitted to its sponsors, the Society of Automotive Engineers and the A.S.T.M., a formal report embodying the following resolutions that had been unanimously adopted by the members of the sectional committee:

"That it is the consensus of opinion of the Sectional Committee that the preparation of a universal numbering system for steels, based on definite specifications, is impracticable except by merely indexing existing specifications, and that further effort to establish such a system is inexpedient;

"That the Secretary of the Sectional Committee be instructed to prepare a brief covering the activities of the Sectional Committee which have led to this conclusion;

"That such brief and this resolution be submitted to all members of the Sectional Committee for their written approval, and that on receipt of replies the matter be referred to the Sponsor Bodies for appropriate action."

The brief referred to in these resolutions reviews fully the origin of the project, with the discussions that have taken place both in meeting and by correspondence since the committee was first organized in May, 1924. A questionnaire sent to representative producers and users of steel who might be interested in a system of numbering indicated clearly a preponderance of opinion that a universal numbering system for steels was impracticable and that effort to establish such system was inexpedient.

The two societies as sponsors approved the report, our Society acting through the Executive Committee and the S.A.E. through its appropriate procedure. The sponsors have submitted this as their final report to the American Engineering Standards Committee, recommending that the project of formulating a universal numbering system for steels be discontinued and that the sectional committee and sponsors therefor be discharged.

Sectional Committee on Classification of Coal*(Continued from page 9)*

<i>Organization</i>	<i>Representative</i>
National Electric Light Assn.....	S. B. Flagg
	Alex. Maxwell, alt.
National Research Council.....	David White
National Retail Coal Merchants Assn.....	S. B. Crowell
Southern Ohio Pig Iron and Coke Assn.....	D. J. Demorest
U. S. Bureau of Mines.....	C. P. White
U. S. Geological Survey.....	M. R. Campbell
	C. E. Dobbin, alt.
Member-at-large.....	W. B. Calkins
Producers.....	7
Distributors.....	2
Consumers.....	8
General Interests.....	8

The sectional committee will undertake the development of a plan for the classification of all coals from anthracite to lignite, based upon such chemical and physical characteristics as will make the plan most readily adaptable to industrial and commercial use on a national scale.

An Executive Committee has been formed, which committee held a meeting on July 14 at which the following three technical committees were appointed: No. 1 on Scientific Classification, H. J. Rose, chairman; No. 2 on Use Classification, W. H. Fulweiler, chairman; No. 3 on Marketing Practice, F. R. Wadleigh, chairman. The committee plans to have these technical committees formally organized in the fall and their work gotten under way so that reports of substantial progress can be presented at the next meeting of the sectional committee, which will be held in March, 1928.

Van Gundy Honored by Dinner

Committee D-2 on Petroleum Products and Lubricants held a dinner, during the annual meeting, on Thursday, June 23, 1927, in honor of Mr. C. P. Van Gundy, Engineer of Tests, of the Baltimore and Ohio Railroad Co. Mr. Van Gundy served as chairman of Committee D-2 for many years, and on his resignation last year, he was elected Honorary Chairman. During the dinner he was presented with a silver-plated replica of the Standard B. & O. Water Tower.

This custom of holding yearly dinners in honor of men who have rendered distinguished service to the committee has been observed by Committee D-2 for several years. Last year the dinner was given in honor of Mr. W. H. Fulweiler, who was then president of the Society.

Testing Laboratory Directory

The National Bureau of Standards, Washington, D. C., has recently issued a directory of commercial testing and college research laboratories of the United States. The purpose of the directory is to inform manufacturers and interested parties of the location of these laboratories, together with indications of the commodity types they are prepared to test. The list includes 207 commercial laboratories and 143 college laboratories which are used for instruction purposes and also research work. Copies of this publication, No. 90, are available at 15 cents each from the Government Printing Office, Washington, D. C.

Addresses Wanted

Persons who know the present addresses of the members whose names and last-known addresses are given below, are asked to advise the Secretary-Treasurer:

BRADT, A. L., Analytical and Consulting Chemist, 5854 Cabanne Ave., St. Louis, Mo.
 DAY, ROLAND B., Consulting Engineer, 25 Broadway, New York City.
 OSBORNE, O. E., Chemist, 317 Oliver St., Whiting, Ind.

Matters Referred to Letter Ballot*(Continued from page 8)*

- Sampling Ferro-Alloys (A 103 - 25 T), recommended by Committee A-9.
 Chemical Analysis of Ferro-Alloys (A 104 - 25 T), recommended by Committee A-9.
 Sampling, Inspection, Packing and Marking of Quicklime and Lime Products (C 50 - 24 T), recommended by Committee C-7.
 Securing Specimens of Hardened Concrete from the Structure (C 42 - 25 T), recommended by Committee C-9.
 Test for Specific Gravity of Pigments (D 238 - 26 T), revised as recommended by Committee D-1.
 Analysis of Grease (D 128 - 26 T), revised as recommended by Committee D-2.
 Test for Distillation of Gasoline, Naphtha, Kerosine, and Similar Petroleum Products (D 86 - 26 T), recommended by Committee D-2.
 Test for Distillation of Natural Gas Gasoline (D 216 - 25 T), recommended by Committee D-2.
 Test for Steam Emulsion of Lubricating Oils (D 157 - 23 T), revised as recommended by Committee D-2.
 Test for Sulfur in Petroleum Oils Heavier than Illuminating Oil (D 129 - 22 T), recommended by Committee D-2.
 Test for Burning Quality of Kerosine Oils (D 187 - 24 T), recommended by Committee D-2.
 Test for Burning Quality of Long-Time Burning Oil for Railway Use (D 219 - 26 T), recommended by Committee D-2.
 Test for Burning Quality of Mineral Colza Oil (D 239 - 26 T), revised as recommended by Committee D-2.
 Test for Thermal Value of Fuel Oil (D 240 - 26 T), revised as recommended by Committee D-2.
 Test for the Determination of Bitumen (D 4 - 26 T), recommended by Committee D-4.
 Test for the Determination of Proportion of Bitumen Soluble in Carbon Tetrachloride (D 165 - 26 T), recommended by Committee D-4.
 Float Test for Bituminous Materials (D 139 - 25 T), recommended by Committee D-4.
 Test for Specific Gravity of Road Oils, Road Tars, Asphalt Cement and Soft Tar Pitches (D 70 - 26 T), recommended by Committee D-4.
 Test for Specific Gravity of Asphalts and Tar Pitches Sufficiently Solid to be Handled in Fragments (D 71 - 26 T), recommended by Committee D-4.
 Testing Small Clear Specimens of Timber (D 143 - 24 T), recommended by Committee D-7.
 Conducting Static Tests of Timber in Structural Sizes (D 198 - 24 T), recommended by Committee D-7.
 Test for Coke Residue of Creosote Oil (D 168 - 23 T), recommended by Committee D-7.
 Chemical Analysis of Zinc Chloride (D 199 - 24 T), recommended by Committee D-7.
 Testing Bituminous Mastics, Grouts and Like Mixtures (D 147 - 25 T), recommended by Committee D-8.
 Felted and Woven Fabrics Saturated with Bituminous Substances for Use in Waterproofing and Roofing (D 146 - 26 T), recommended by Committee D-8.
 Testing Asphalt Roll-Roofing Surfaced with Fine or Granular Talc, Slate-Surfaced Asphalt Roll-Roofing and Slate-Surfaced Asphalt Shingles (D 228 - 26 T), recommended by Committee D-8.
 Testing Electrical Insulating Oils (D 117 - 26 T), revised as recommended by Committee D-9.
 Verification of Testing Machines by Means of an Elastic Calibration Bar (E 4 - 26 T), revised as recommended by Committee E-1.
 Brinell Hardness Testing of Metallic Materials (E 10 - 25 T), recommended by Committee E-1.
Tentative Definitions of:
 Terms Relating to Coal and Coke (D 121 - 26 T), revised as recommended by Committee D-5.
 The Term Slate (D 247 - 26 T), revised as recommended by Committee D-16.
 Terms Relating to Textile Materials (D 123 - 26 T), revised as recommended by Committee D-13.
 The Term Metallography (E 7 - 26 T), recommended by Committee E-4.
 Terms Relating to Specific Gravity (E 12 - 26 T), recommended by Committee E-8.
Tentative Recommended Practices for:
 Carburizing and Heat Treatment of Carburized Objects (A 37 - 25 T), recommended by Committee A-4.
 The Care of the Eyes When Using a Metallographic Microscope (E 2 - 26 T), recommended by Committee E-4.

A blank ballot with return envelope for the vote on these items is enclosed with this BULLETIN to all members in good standing. The ballot will be canvassed on September 1, 1927.

New Members to July 31, 1927

The following 137 members were elected from April 20, 1927, making the total membership 4,260.

Acme Steel Co., R. H. Norton.
 Acres & Co., Ltd., H. G., Consulting Engineers, R. L. Hearn.
 Adams, H. S. (Consulting Engineer).
 Allentown Portland Cement Co., W. H. Andrews.
 Allentown Testing Laboratory, E. B. McCready.
 American Bureau of Inspection and Tests, E. B. Wilson.
 American Steel Abrasives Co., L. A. Cline.
 Address, G. W. (Bureau of Streets, Newark, N. J.).
 Ann Arbor, Mich., City of, George Sandenburgh.
 Arenas, Eduardo (Civil Engineer).
 Armco Culvert Manufacturers Assn., H. W. Rinearson.
 Bates, W. A. (Walter Bates Steel Corp.).
 Beemer, A. W. (Beaver Products Co.).
 Bennett, J. G. (Lewis Institute).
 Berry Iron & Steel Co., G. D. Berry.
 Blaw-Knox Co., L. A. Prescott.
 Bognar, E. J. (Student Member, Ohio State University).
 Bruce, H. D. (U. S. Bureau of Standards).
 Bucknell University, Civil Engineering Department, D. M. Griffith.
 Buning, H. L. (Koninklijke Nederlandsche Maatschappij, Benzine Installatie Rotterdam).
 Burmah Oil Co., Ltd., The, Research Department.
 Canadian Engineering Standards Association, B. S. McKenzie.
 Case Threshing Machine Co., J. I., W. H. Naegely.
 Cellulose Products Co., Carl Byron.
 Cherokee Brick Co., K. W. Dunwoody.
 Cleveland, H. B. (Consulting Sanitary Engineer).
 Climax Rock Drill & Engineering Works, Ltd., Alfred Ewing.
 Colwell, D. L. (Stewart Die Casting Corp.).
 Conahey, George (The Celite Co.).
 Consolidated Rolling Mills & Foundries Co., S. A., C. G. Seifert.
 Cook, R. W. (Wallace Barnes Co.).
 Corrigan, McKinney Steel Co., L. Selmi.
 Cox, J. W., Jr. (Consulting Textile Engineer & Specialist).
 Dana, A. S. (Kerite Insulated Wire & Cable Co.).
 Delta Star Electric Co., H. W. Young.
 Detroit, City of, Dept. of Purchases & Supplies, J. E. Mills.
 Detroit, City of, Dept. of Street Railways, P. A. Kerwin.
 Direzione delle Costruzioni Navali e Meccaniche, Spezia, Italy.
 Dodge, F. E. (National Lead Co.).
 Dynes, R. S. (Pennsylvania Petroleum Products Co., Inc.).
 Farmer, H. G. (Civil Engineer).
 Felton, T. M. (Student Member, Ohio State University).
 Ferguson, M. W. (Stone Tile & Supply Co.).
 Ferrocarriles Nacionales de Mexico, Agente Gral. de Compras, Mexico.
 Ferrocarriles Nacionales de Mexico, Ing. Quimico en Jefe, Mexico.
 Gascoigne, G. B. (Consulting Sanitary Engineer).
 General Standard Steel Corp., N. H. Jacovatos.
 Gilmore, R. B. (Queen's Run Refractories Co., Inc.).
 Gilmore, R. E. (Dept. of Mines, Canada).
 Globe Steel Tubes Co., J. S. Bradshaw.
 Greenall, C. H. (Bell Telephone Laboratories, Inc.).
 Harrington and King Perforating Co., F. P. Hutchinson.
 Hartford, Conn., City of, Dept. of Engineering, R. N. Clark.
 Hill, H. G. (The Texas Co.).
 Hippensteel, C. L. (Bell Telephone Laboratories, Inc.).
 Hogaboom, G. B. (Research Electroplater).
 Howell, H. C. (Barber Asphalt Co.).
 Huber, Lee (Indiana Limestone Co.).
 Hudson Coal Co., D. J. Jones.
 Hutton, S. E. (Pacific Coast Co.).
 Irwin, P. L. (Westinghouse Electric & Manufacturing Co.).
 James, W. E. (Chemist).
 Johnson, L. E. (Finishing Lime Association of Ohio).
 Kessler, J. M. (Kessler Chemical Co.).
 Keystone Oil & Manufacturing Division of the Central Commercial Co., J. W. Langdale.
 Kurman, N. A. (Herald Electric Co., Inc.).
 La Porte, C. W. (Keystone Steel & Wire Co.).
 Latrobe Electric Steel Co., W. H. Keen.
 Lauder, Archibald (Eugene F. Phillips Elec. Works, Ltd.).
 Lewis, H. J. (Dept. of Public Works, Muskegon, Mich.).
 Lingley, R. G. (City Engineer, Worcester, Mass.).
 Lose, R. G. (Structural Engineer).
 Marshall, R. B. (Detroit Edison Co.).
 Martin Co., The L., G. C. Lewis.
 Maule Ojus Rock Co., E. P. Maule.
 McGuire, D. D. (Tennessee Dept. of Highways).
 McKee & Co., Arthur G., K. F. Juengling.
 McNary, J. E. (Standard Oil Co. of New York).
 Merchant Venturers' Technical College, Andrew Robertson.
 Mexico Dept. de Establecimientos Fabriles Y Aprovisionamientos Militares, Mexico.
 Michigan Copper & Brass Co., G. M. Fritch.
 Mullen, C. A. (Consulting Paving Engineer).

Murray and Flood, Henry Flood, Jr.
 Norton, P. T., Jr. (University of Wisconsin).
 Ohio Valley Rock Asphalt Co., Inc., G. W. Rapp.
 O'Neil, Perry (Municipal Engineering Co.).
 Pacific Coast Tale Co., George Ames.
 Pacific Creosoting Co., H. E. Horrocks.
 Page Steel & Wire Co., L. W. Hopkins.
 Partenheimer, J. E. (Fisk Rubber Co.).
 Peck Rolling Mills, Ltd., G. C. Broadbent.
 Pennsylvania Brick & Tile Co., J. C. Funck.
 Pennsylvania-Ohio Power & Light Co., W. B. Smith.
 Pontiac, City of, Engineering Dept., J. R. Pollock.
 Pumicite Co., E. L. Heidenreich.
 Quasi-Arc Incorporated, H. L. Ammann.
 Robbins, F. M. (Ross Meehan Foundries).
 Robertson Steel & Iron Co., W. F., J. W. White.
 Roessler & Hasslacher Chemical Co., C. S. Williams.
 Romaine, E. V. (General Naval Stores Co.).
 Rosenthal, Helman (Dallas Laboratories).
 Royal Manufacturing Co., I. P. Strauss.
 Ryan & Co., F. J., E. L. Willson.
 San Antonio Portland Cement Co., Charles Baldus.
 Sanitary District of Chicago, L. C. Whittemore.
 Saunders, H. F.
 Schaurte, W. T. (Bauer & Schaurte).
 Scott, Howard (Westinghouse Electric & Manufacturing Co.).
 See Elevator Co., Inc., A. B., V. A. O'Neil.
 Shotton, B. G. (Hendrick Manufacturing Co.).
 Slater, A. C. (Mackenzie College, Sao Paulo, Brazil).
 Staples, E. M. (Canadian Bronze, Ltd.).
 Thermo-Technical Inst., L. K. Ramzin.
 Thurner Heat Treating Co., R. J. Thurner.
 Tobias, F. J. (Marf Machine & Die Casting Co.).
 Tottenham, P. M. (Chief Inspecting Engineer, Egyptian Government).
 Trumbull Steel Co., C. W. Weesner.
 Truscon Steel Co., R. D. Snodgrass.
 Underwood, C. H. (Chemical Engineer, City of Indianapolis, Ind.).
 University of Leeds, R. Offor.
 Utica, N. Y., City of, H. R. Hayes.
 Virginia Military Inst., Civil Eng. Dept., R. A. Marr, Jr.
 Virginia Portland Cement Corp., H. A. Williams.
 Wagner Electric Corp., C. B. Swander.
 Wagner, R. W. (Antwerp Telephone & Electrical Works).
 Warner Chemical Co., Louis Neuberg.
 Watson, T. P. (Pennsylvania R. R. Co.).
 Wetherell, L. H. (Wetherell Brothers Co.).
 Wheat Culvert Co., Inc., W. H. D. Wheat.
 Wilder, F. A. (Grinnell College).
 Williams, J. R. (Provincial Assayer, Vancouver, B. C.).
 Wise Industries, M. M. Wise.
 Wood, A. T. (Basic Products Co.).
 Woodstock Slag Corp., G. A. Mattison, Jr.
 Wuppermann, Theodor.
 Yates, J. J. (Central Railroad Co. of New Jersey).
 Yearword, J. R. (National Lime & Stone Co.).

We announce with regret the death of four members:

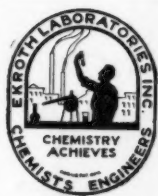
GEORGE MATHESON, JR., Vice-President and Treasurer, Spang, Chalfant and Co., Inc., Union Bank Building, Pittsburgh, Pa.
 IRA H. WOOLSON, Consulting Engineer, National Board of Fire Underwriters, 85 John St., New York City.
 T. S. SLIGH, JR., Physicist, U. S. Bureau of Standards, 3409 Rodman St., N. W., Washington, D. C.
 LOUIS J. McGRATH, Secretary-Treasurer, Thomas Devlin Manufacturing Co., Third St. and Lehigh Ave., Philadelphia, Pa.

Ira Harvey Woolson

1856-1927

It is with much regret that we record the death, on May 8, of Ira H. Woolson, consulting engineer on buildings for the National Board of Fire Underwriters, New York City. He was the organizer of the National Board of Fire Underwriters' Committee on Construction and was an authority on building codes, serving under Secretary Hoover as chairman of the Building Code Committee of the Department of Commerce. Since 1904, when our Committee C-5 on Fire Tests of Materials and Construction was organized, Mr. Woolson had been its chairman, and during that time had been instrumental in the very valuable work which that committee has contributed to the work of the Society.

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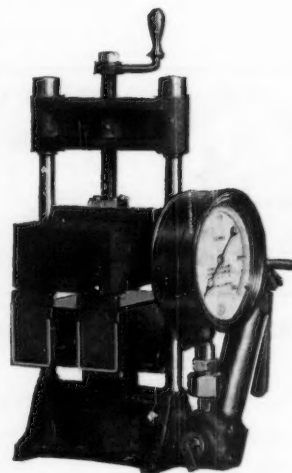
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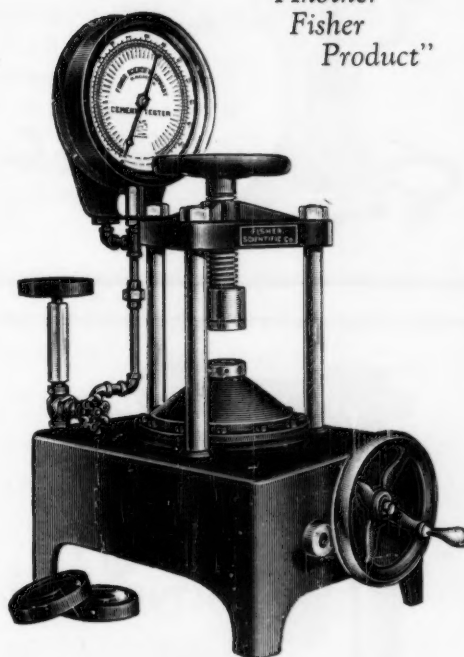
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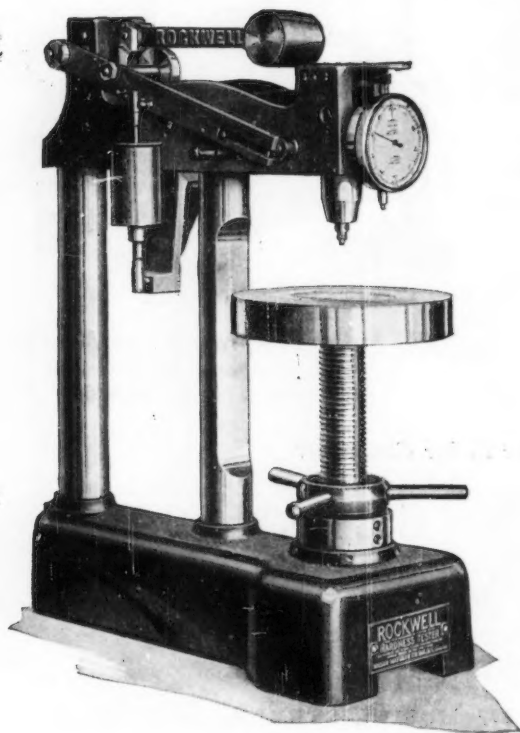
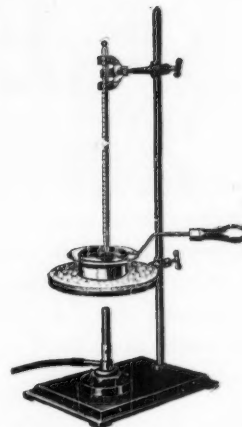
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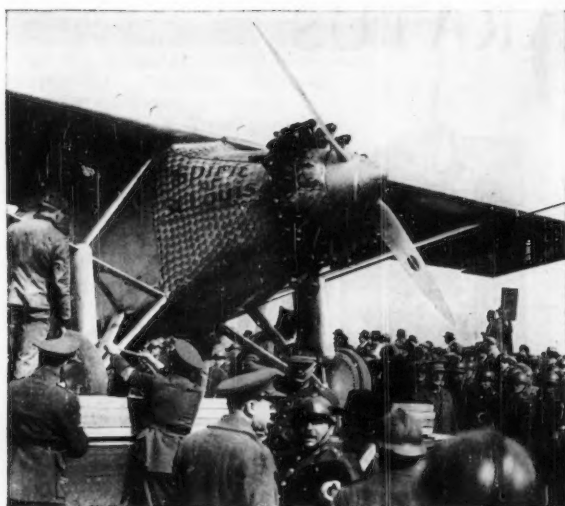
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DURABLE**



Are all clearly revealed in the Pittsburgh Testing Laboratory by expert chemists and physicists with a national reputation for dependable analysis.

The Pittsburgh Testing Laboratory has served industry for 45 years and the P.T.L. certificate of inspection is recognized as authentic by officials all over the country.

If you require a test or analysis—send it to the Pittsburgh Testing Laboratory.

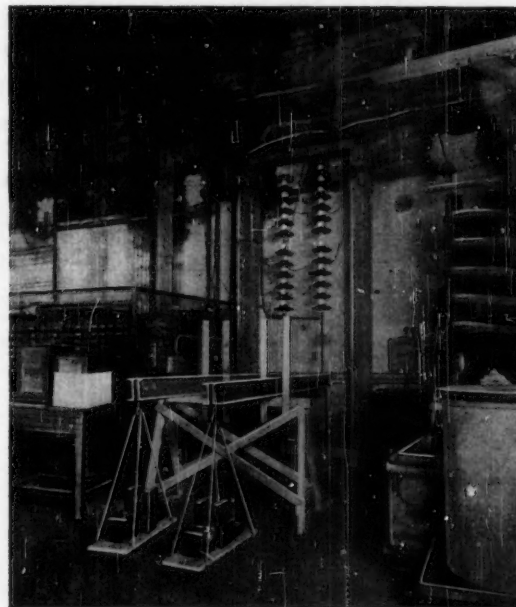
PITTSBURGH TESTING LABORATORY
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Branch Offices in Principal Cities

Testing Insulators UNDER Combined Stresses

90,000 volts and 6,000 lb. in tension applied
simultaneously for a duration of 72 hours

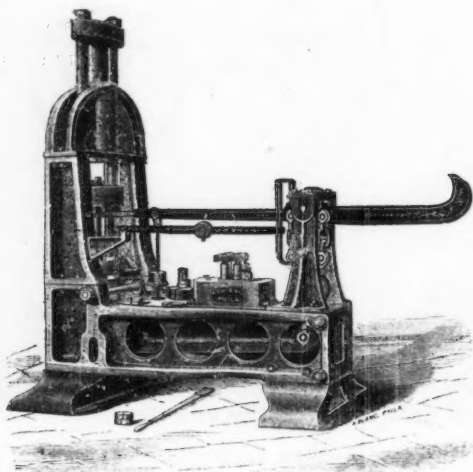
The apparatus illustrated is just one example of special equipment designed and built at E. T. L. to provide facilities for making determinations of an unusual nature. Our engineers are always glad to confer with you regarding your special requirements.

N. B.—We have several rooms fully equipped as private laboratories for those who prefer to conduct their own tests.



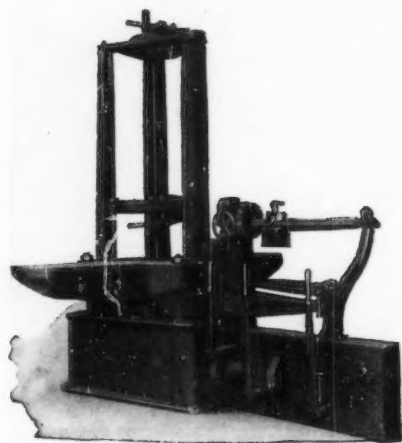
ELECTRICAL TESTING LABORATORIES
80TH ST. AND EAST END AVE. NEW YORK CITY

1875 Model



This old machine was of 20,000 lb. capacity, hydraulically operated and was one of the first all-metal testing machines manufactured.

1927 Model



This 50,000 lb. capacity machine was patented in the United States, February 16, 1926, and in Great Britain, July 29, 1926. It is of the three rotating reversed wide screw type and has a transverse table capable of taking specimens six feet long.

"Lindying" over Obstacles

An expression that was meaningless yesterday but today as expressive as any word known to the millions who followed that memorable flight from New York to Paris. Many things made this possible—the courage, skill and will to win of the pilot—the thoughtful care for every emergency shown by the designers of the plane—and the detailed pains and workmanship of the men that constructed the Spirit of St. Louis. For over one hundred years we, too, have been Lindying over obstacles and problems that arose in our manufacturing field, and day in and day out we are still trying to improve our machines to better enable you to get satisfactory results. The three rotating reversed screw type patented last year accomplishes much that is new in a universal machine; our million-pound wide-screw machine gives more room than any other type ever constructed; our mirror extensometer reading by 1/100,000 of an inch is also a new development. Not a week goes by that our engineers do not think of some refinement to our products or test out some new design. Get in touch with us when you need any testing equipment, or what is better, drop in and see us when in Philadelphia and talk over any of your problems with us. Maybe we can help you to Lindy over your obstacles.

Riehlé Bros. Testing Machine Co.

1424 North 9th Street, Philadelphia, Pa.

Modern Industrial Testing Machines

Testing machines consist of two distinct elements:—

- (1) AN ACCURATE LOAD-WEIGHING SYSTEM
- (2) A SENSITIVE PRESS

FOR the first time in testing machine construction the EMERY-TATNALL COMPANY offers machines in which each element is accorded the treatment of a specialist.

¶ A. H. EMERY furnishes and installs the weighing system. For over 50 years the Emery precision testing and weighing systems have been favorably known to the engineering profession.

¶ The Southwark Foundry & Machine Company, under the supervision of Emery-Tatnall Company engineers, builds the press and fits up the power plant.

¶ There are great economies effected by this combination. The customer may choose from more than two hundred standard designs, to any of which the Emery weighing system can be applied. The standard designs effect the first big reduction in ultimate cost. The second reduction is gained by the development of the automatic load indicating and recording installation applied to the Emery hydraulic support. This introduces operating economies and conveniences as well.

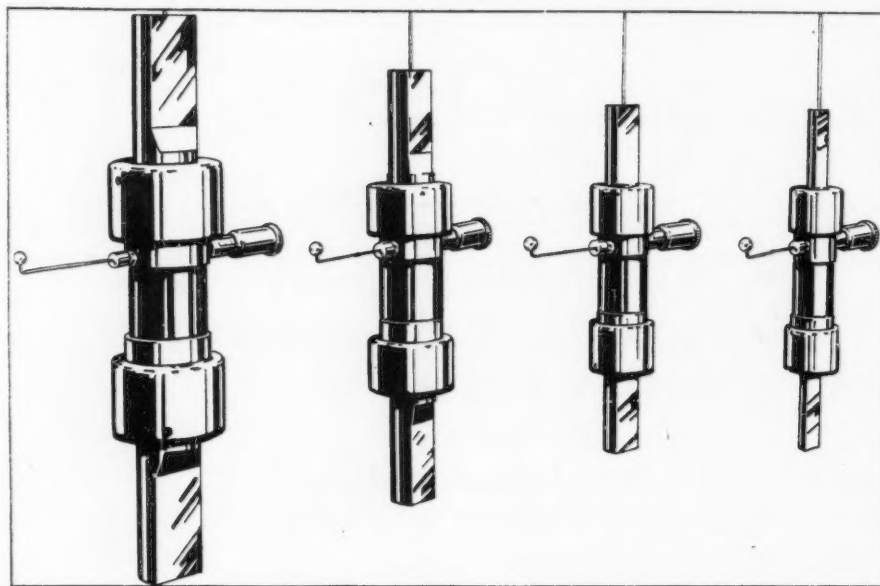
¶ Quotations and plans to suit any requirement will be promptly furnished.

¶ This applies particularly to the heavy duty machines ranging from 200,000 to 3,000,000-lb. capacity. Machines up to 20,000,000 lbs. capacity can be furnished.

New bulletins on THE ELECTRIC TELEMETER are available for distribution describing in detail this instrument for the measurement of live loads, vibrations and impacts in engineering structures during actual operation and service.

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available for use in tension and compression, are being used all over the world for checking the accuracy of *vertical* and *horizontal* testing machines, of any make, over their *entire* range. They are accurate instruments, of comparatively light weight, inserted in the machine to be checked, the same as a test specimen.

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